KST3421A

-30V P-Channel MOSFET

General Description

The KST3421A uses advanced trench technology to provide excellent R_{DS}(ON) with low gate charge. This device is suitable for use as a load switch or in PWM applications

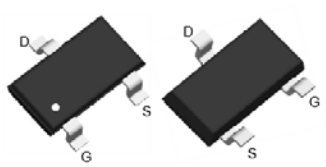
Product Summary

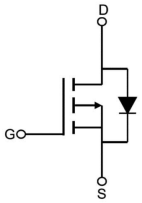
V_{DS} (V)	$R_{DS(on)}$ (mΩ)	I_D (A)
-30	29 at V_{GS} = 10 V	-5.8
	45 at V_{GS} = 4.5 V	-3.3

Features

- High power and current handing capability
- Lead free product is acquired
- Surface mount package

SOT-23-3L Pin Configuration





Applications

- Battery protection
- Load switch
- Power management

Absolute Maximum Ratings Tc=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_C=25℃)	-5.8	A
	Drain Current – Continuous (T_C=100℃)	-3.0	A
I_{DM}	Drain Current – Pulsed[1]	-30	A
P_D	Power Dissipation (T_C=25℃)	1.0	W
	Power Dissipation (T_C=100℃)	0.3	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	75	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	26	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	-30	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-30V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=-30V , V_{GS}=0V , T_J=125℃	---	---	10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V , I_D=-4.5A	---	29	35	mΩ
		V_{GS}=-4.5V , I_D=-3A	---	41	50	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	-1.1	-1.57	-2.3	V
gfs	Forward Transconductance	V_{DS}=-5V , I_S=-4A	---	18	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge	V_{DS}=-10V , V_{GS}=-4.5V , I_D=-4A	---	18	---	nC
Q_{gs}	Gate-Source Charge		---	3.6	---	
Q_{gd}	Gate-Drain Charge		---	5.5	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=-15V,I_D=-4A V_{GS}=-10V,R_G=3.3Ω	---	16	---	ns
T_r	Rise Time		---	8.6	---	
$T_{d(off)}$	Turn-Off Delay Time		---	28	---	
T_f	Fall Time		---	12	---	
C_{iss}	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , F=1MHz	---	786	---	pF
C_{oss}	Output Capacitance		---	103	---	
C_{rss}	Reverse Transfer Capacitance		---	90	---	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	-5.8	A
I_{SM}	Pulsed Source Current		---	---	-14	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-1.2	V

Note :

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics (Curves)

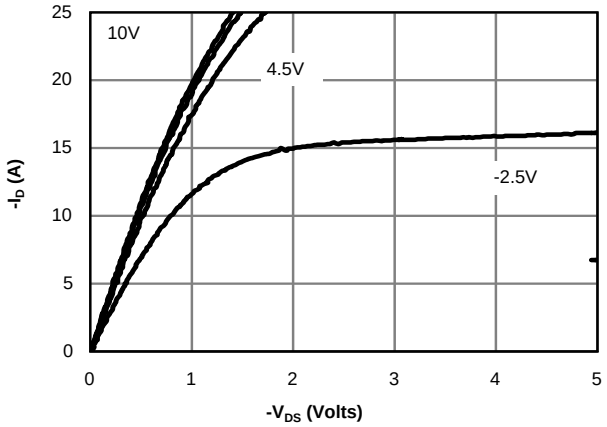


Fig 1: On-Region Characteristics

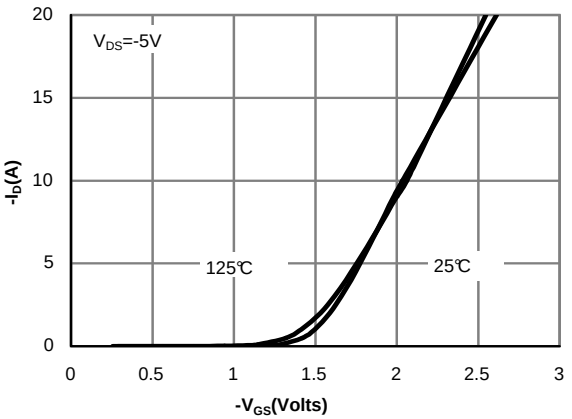


Figure 2: Transfer Characteristics

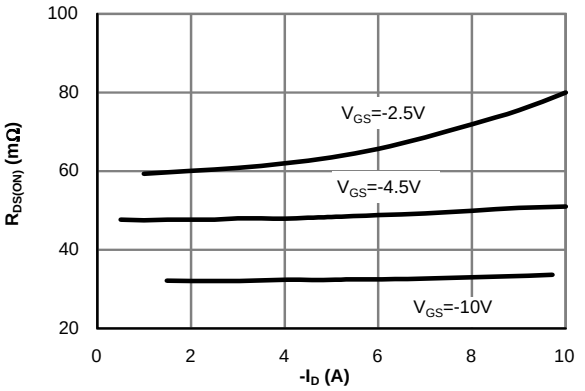


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

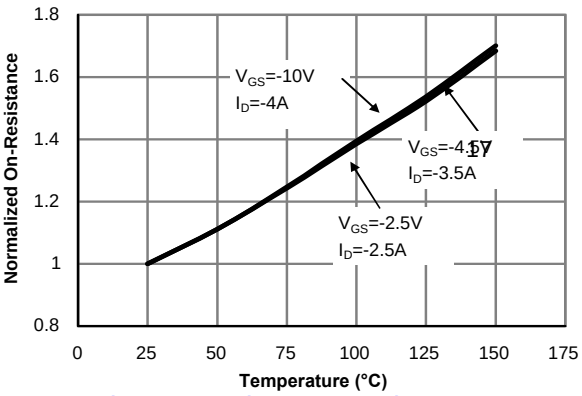


Figure 4: On-Resistance vs. Junction Temprature

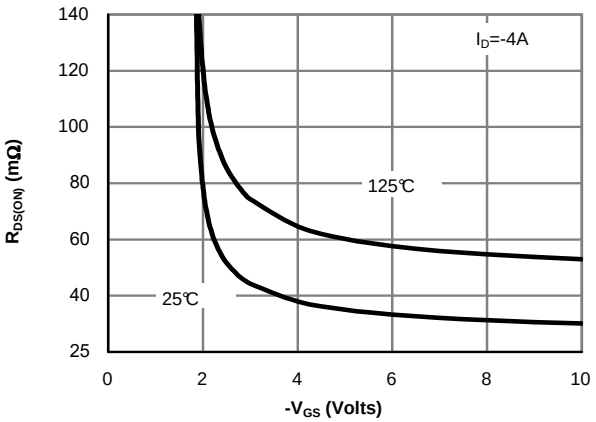


Figure 5: On-Resistance vs. Gate-Source Voltage

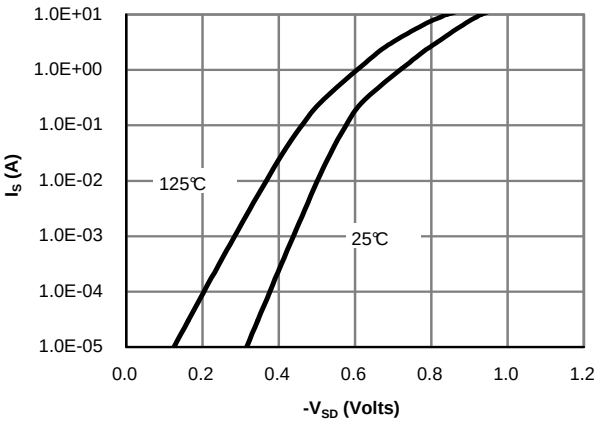


Figure 6: Body-Diode Characteristics

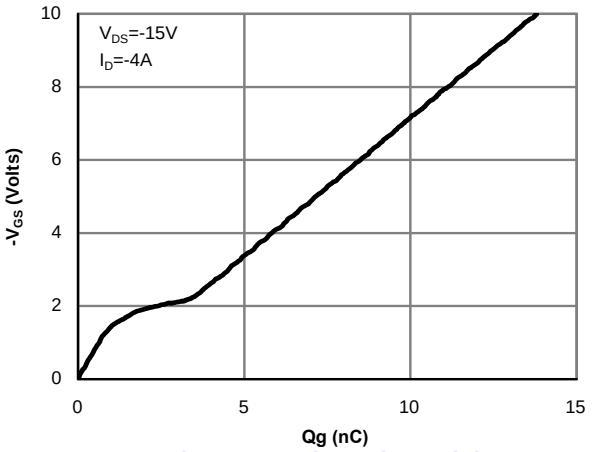


Figure 7: Gate-Charge Characteristics

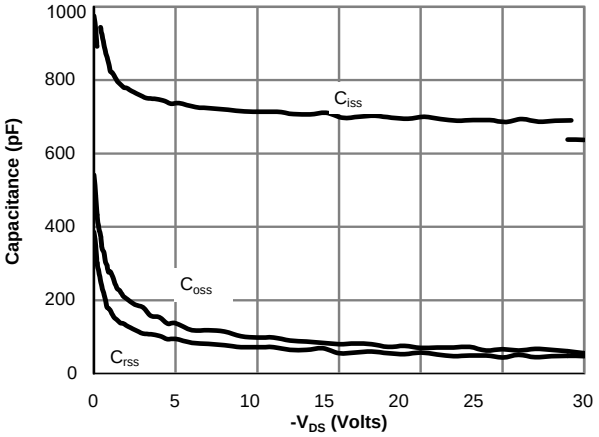


Figure 8: Capacitance Characteristics

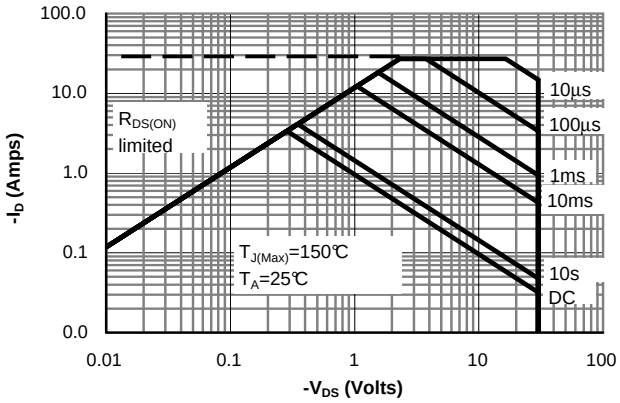


Figure 9: Maximum Forward Biased Safe Operating Area

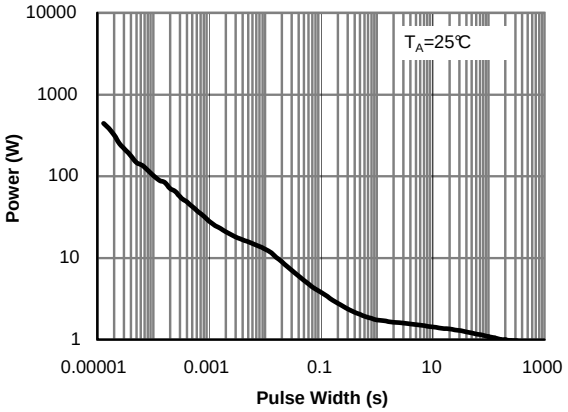


Figure 10: Single Pulse Power Rating Junction-to-Ambient

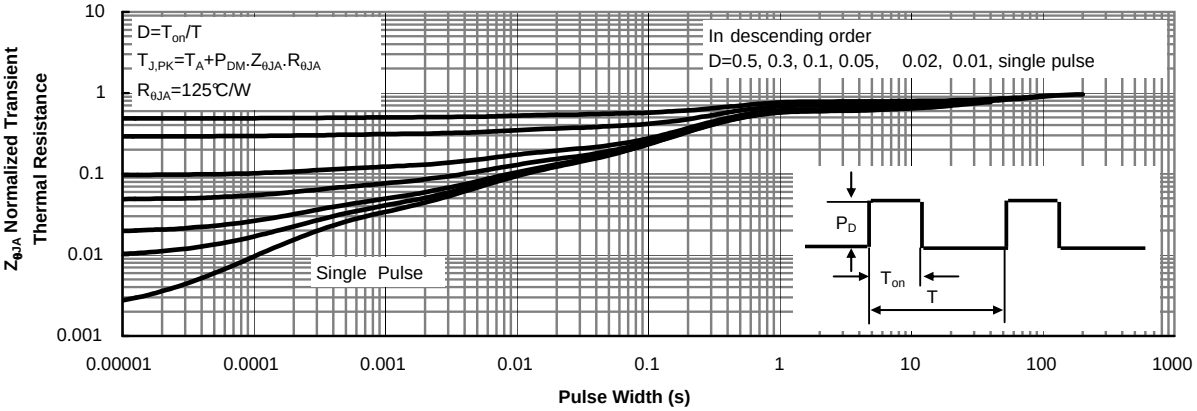


Figure 11: Normalized Maximum Transient Thermal Impedance

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